CLAIMS

1. An adaptive multifilar antenna comprising:

n spaced filaments, where n is an integer greater than 1;

at least one filament group having a predetermined plurality of the filaments coupled together in a fixed phase relationship;

a weighting circuit operable to apply phase adjustments to signals passed to and/or from the n filaments and/or filament group;

detecting means operable to detect at least one electrical property of the multifilar antenna with respect to the frequency, polarisation and/or direction of propagation of a signal to be received or transmitted by the multifilar antenna and/or impedance matching of the antenna; and

control means, responsive to the detecting means, operable to control the operation of the weighting circuit to adjust the properties of the multifilar antenna to suit better a current signal to be received or transmitted.

2. An antenna according to claim 1, wherein the weighting circuit is operable to

apply gain adjustments to signals passed to and/or from the filaments and/or filament group.

3. An antenna according to claim 1 or claim 2, wherein the control means is operable to control the operation of the matching circuit to adjust the properties of the multifilar antenna to suit better a current signal to be received or transmitted.

4. An antenna according to any preceding claim, including switch means associated with a plurality of the filaments for selectively altering the electrical length and/or interconnections of the filaments and the signal connections to/from the filaments being at a first end of each filament; and

the switch means being operable to selectively interconnect pairs of filaments a second end of those filaments being remote from the first end.

5. An antenna according to any preceding claim, including switchable filaments having switch means for selectively altering the electrical length and/or interconnections of the switchable filaments and

each of the switchable filaments including at least a first filament section and a second filament section; and

the switch means being operable to selectively connect or isolate the first and second filament sections of each switchable filament so as to vary the electrical length of that filament.

6. An antenna according to any one of the preceding claims, in which:

the detecting means is operable to detect a signal to noise ratio of a received signal; and

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the control means is operable to control the operation of the matching circuit and/or the weighting circuit so as to improve the signal to noise ratio of the received signal.

7. An antenna according to any one of the preceding claims, in which:

the detecting means is operable to detect a signal to (noise plus interference) ratio of a received signal; and

the control means is operable to control the operation of the matching circuit and/or the weighting circuit so as to improve the signal to (noise plus interference) ratio of the received signal.

8. An antenna according to any one of the preceding claims, in which:

the detecting means is operable to detect a signal level of a received signal; and

the control means is operable to control the operation of the matching circuit and/or the weighting circuit so as to improve the signal level of the received signal.

9. An antenna according to any one of the preceding claims, in which:

the detecting means is operable to detect a VSWR for a transmitted signal; and

the control means is operable to control the operation of the matching circuit and/or the weighting circuit so as to improve the VSWR for transmission of that signal.

10. An antenna according to any one of the preceding claims, in which the detecting means comprises:

analogue to digital conversion means for converting respective signals received by the filaments and/or filament group into corresponding digital representations

a memory for storing the digital representations;

means for combining the digital representations using respective phase relationships and gains; and

means for detecting properties of the antenna by analysis of the combined digital representations.

11. An antenna according to any one of claims 1 to 9, in which the detecting means comprises:

means for combining respective signals received by the filaments and/or filament group using respective phase relationships

analogue to digital conversion means for converting the combined signals into a corresponding digital representation;

a memory for storing the digital representation; and

means for detecting properties of the antenna by analysis of the combined digital representations.

12. An antenna according to claim 11, wherein the combining means is operable

to combine the respective signals using respective gain weighting.

13. An antenna according to any one of the preceding claims, in which the detecting means operates at least during reception of a reference signal burst by the antenna.

14. An antenna according to any one of the preceding claims, in which n is an even integer.

15. An antenna according to any one of the preceding claims, in which n is equal to 4 or 6.

16. An antenna according to any preceding claim, wherein n is 4 and including two filament groups each of two diametrically opposed filaments, the filaments in each respective group being coupled together with a phase weighting of substantially 180°.

17. An antenna according to any preceding claim wherein the filaments in the or each filament group have a diversity correlation of 0.7 or better.

18. An antenna according to any one of the preceding claims, in which the filaments are helically shaped.

19. An antenna according to any one of the preceding claims, in which the filaments are at least partially intertwined.

20. An antenna according to any preceding claim, having a volute of generally elliptical or rectangular axial cross-section.

21. An antenna according to any preceding claim, wherein the weighting circuit operates at baseband.

22. An antenna according to any of claims 1 to 18, wherein the weighting circuit operates at RF.

23. An antenna according to claim 20, wherein the respective outputs of the weighting circuit are combined prior to frequency downconversion.

24. An antenna according to any preceding claim, including a matching circuit for matching the characteristic impedance of the antenna to that of a transmitting and/or receiving apparatus.

25. An adaptive multifilar antenna comprising:

n spaced antenna filaments, where n is an integer greater than 1;

at least one filament group having a predetermined plurality of the filaments coupled together in a fixed phase relationship;

a matching circuit for matching the characteristic impedance of the antenna to that of a transmitting and/or receiving apparatus;

a phasing circuit for applying respective gain and phase adjustments to signals passed to and/or from the n filaments and/or filament group;

switch means associated with each filament for selectively altering the electrical length and/or interconnections of the filaments;

means for detecting electrical properties of the multifilar antenna with respect to the frequency, polarisation and/or direction of propagation of a signal to be received or transmitted by the multifilar antenna and/or impedance matching of the antenna; and

control means, responsive to the detecting means, for controlling the operation of the matching circuit, the phasing circuit and the switch means to adjust the properties of the multifilar antenna to suit better a current signal to be received or transmitted.

26. A multifilar antenna substantially as hereinbefore described with reference to the accompanying drawings.